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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/813,152	03/21/2001	Tetsuya Nakabayashi	0033-0701P	1937
2292	7590	01/29/2004	EXAMINER	
BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747			VINH, LAN	
			ART UNIT	PAPER NUMBER
			1765	

DATE MAILED: 01/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/813,152

Applicant(s)

NAKABAYASHI ET AL.

Examiner

Lan Vinh

Art Unit

1765

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 01 December 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1,2,4-7 and 10-12 is/are pending in the application.
- 4a) Of the above claim(s) 1 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 11-12 is/are allowed.
- 6) ☒ Claim(s) 2,4-7 and 10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☒ Certified copies of the priority documents have been received in Application No. 09813152.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 2, 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue et al (US 5,468,344) in view of Hayakawa et al (US 5,254,171)

Inoue discloses a method for manufacturing semiconductor device comprising the steps of:

forming a etching mask 122 on a portion of clamp 124/susceptor forming contact with Si chip 121 (col 3, lines 12-15, fig. 1)

applying a blasting process on the surface of clamp 124/susceptor (col 3, lines 29-30)

etching the surface of clamp 124/susceptor (col 3, lines 31-33)

Inoue also discloses that the clamp 124/susceptor includes a main body 124, a protruding portion/step portion 133 on the main body 132 to support substrate 131 from the bottom, the portion 133/step portion having a size smaller than the substrate 131 (fig. 2), fig. 1 shows that masking layer 122 masks a portion of clamp/susceptor main body 124

Unlike the instant claimed invention as per claim 2, Inoue does not specifically disclose forming a clamp/susceptor that has SiO<sub>2</sub> as a main component

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However, Hayakawa, in a method of plasma etching using an apparatus, teaches using a quartz glass clamp to hold wafer/susceptor (col 4, lines 10-12), which reads on forming a clamp/susceptor that has SiO<sub>2</sub> as a main component.

Hence, one skilled in the art would have found it obvious to modify Inoue's method by forming a clamp/susceptor that has SiO<sub>2</sub> as a main component as per Hayakawa because according to Hayakawa quartz coating prevents the generation of contaminants and particles (col 1, lines 55-57)

Regarding claim 6, Inoue discloses the step of rinsing the clamp/susceptor after etching (col 3, lines 60-64)

3. Claims 4, 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue et al (US 5,468,344) in view of Hayakawa et al (US 5,254,171) and further in view of Macdonald et al (US 6,494,960)

Inoue as modified by Hayakawa has been described above in paragraph 2. Inoue and Hayakawa differ from the instant claimed inventions as per claims 4, 10 by performing the step of rinsing the surface of the susceptor after the step of blasting instead of prior to the step of blasting.

However, Macdonald discloses a method for removing a coating from a substrate comprises the step of rinsing the substrate before/in prior to an abrasion step such as a blasting step (col 7, lines 29-34)

Hence, one skilled in the art would have found it obvious to modify Inoue and Hayakawa method by rinsing the surface of the susceptor prior to the step of blasting in

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view of Macdonald's teaching because according to Macdonald the use of the rinsing step before the abrasion step/blasting step usually decreases the time required for carrying out the abrasion/blasting step (col 7, lines 33-36)

4. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue et al (US 5,468,344) in view of Hayakawa et al (US 5,254,171) and further in view of Gorczyca et al (US 6,368,410)

Inoue as modified by Hayakawa has been described above in paragraph 2. Unlike the instant claimed invention as per claim 5, Inoue and Hayakawa fail to disclose carrying the blasting step using SiC.

However, Gorczyca discloses a method of processing semiconductor article comprises the step of blasting the quartz article using SiC (col 3, lines 10-11)

Hence, one skilled in the art would have found it obvious to modify Inoue and Hayakawa by carrying the blasting step using SiC as per Gorczyca because Gorczyca states that the quartz articles is preferably roughened by sand blasting using SiC (col 3, lines 10-11)

5. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue et al (US 5,468,344) in view of Gorczyca et al (US 6,368,410)

Inoue discloses a method for manufacturing semiconductor device using a jig comprising the steps of:

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applying a blasting process on the surface of Si chip 121/subject to be processed  
(col 3, lines 29-30)

etching the surface of Si chip 121/subject to be processed (col 3, lines 32-33)

rinsing/cleaning the surface of Si chip/subject to be processed (col 3, lines 50-53)

Inoue also discloses that the clamp 124/susceptor includes a main body 124, a protruding portion/step portion 133 on the main body 132 to support substrate 131 from the bottom, the portion 133/step portion having a size smaller than the substrate 131 (fig. 2), fig. 1 shows that masking layer 122 masks a portion of clamp/susceptor main body 124 prior to performing the blasting step

Unlike the instant claimed invention as per claim 7, Inoue does not specifically disclose rinsing the Si chip /subject to be processed at high pressure.

However, Gorczyca discloses a method of processing semiconductor article comprises the step of rinsing the wafer at high pressure (col 5, lines 56-67)

Hence, one skilled in the art would have found it obvious to modify Inoue's rinsing step by rinsing the Si chip /subject to be processed at high pressure as per Gorczyca because Gorczyca teaches that high pressure spray/high pressure rinsing removes loosely adhering quartz pieces thus reducing the possibility of introducing particles into the chamber (col 5, lines 56-61)

***Allowable Subject Matter***

6. Claims 11-12 allowed.

The following is an examiner's statement of reasons for allowance:

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Regarding claims 11-12, the cited prior art of record fails to disclose or suggest the step of repeating another etching step and high pressure rinsing prior to the blasting step. The closest cited prior art of Inoue (US 5,468,344) discloses performing only one etching step after the blasting step.

### ***Response to Arguments***

7. Applicant's arguments filed 12/1/2003 have been fully considered but they are not persuasive.

The applicants argue that the claw 133 as shown in fig. 2 of the Inoue reference is different from the claimed stepped portion (as recited in claim 2) because : Inoue's element 133 is merely a hook portion and cannot attain the effect described in the instant specification, the masking layer 122 is not provided between the stepped portion 133 and substrate 131, but instead provided beneath Si chip 121 as shown in fig. 1 and 2 of Inoue. This argument is unpersuasive because the argument that Inoue's claw 133 cannot attain the effect described in the instant specification does not commensurate with the scope of claim 2 since claim 2 does not recited a stepped portion attains the effect described in the instant specification. Since fig. 2 of Inoue shows that the claw 133 is provided on a clamp/susceptor 132 to support a substrate 131 from the bottom, the claw 133 is smaller than the substrate 131, fig. 1 also shows that the mask 122 masks a portion of a clamp 124/susceptor forming contact with the substrate 121 while fig. 2 shows that the portion of clamp 132 contacting the substrate 131 having the claw

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133. Thus, the examiner asserts that Inoue's claw 133 is being masked in a masking step and meets the requirement of claimed stepped portion in claim 2.

The applicants further argue that the making layer 122 of Inoue is different from the masking layer as claimed in claim 2 because: Inoue masking layer does not form contact with the substrate, Inoue masking layer 122 can not attain the effect described in the specification. The examiner disagrees because: as clearly shown in fig. 1 of Inoue, the masking layer 122 contacts the substrate 121, the argument that Inoue's masking layer 122 cannot attain the effect described in the instant specification does not commensurate with the scope of claim 2 since claim 2 does not recited a masking step that attains the effect described in the instant specification.

In response to the applicant's argument that the blasting step on the surface of a susceptor is not disclosed in Inoue, the examiner refers to fig. 1 and col 3, lines 27-30 of Inoue wherein Inoue discloses blasting the gas through the clearance between the edge 125 and the clamps 124/susceptor.

It is argued that the rinsing step of the MacDonald reference is conducted using a chemical process whereas the rinsing step of claims 4 and 10 using high pressure rinsing/physical processes. The examiner disagrees because as recited in col 7, lines 29-34 of MacDonald, MacDonald discloses rinsing by immersing the substrate in an agitated bath of rinsing solution, which reads on a high pressure rinsing/physical processes.

The argument that the Gorczyca does not disclose the use of quartz particle as blasting particles as required in claim 5 is unpersuasive because Gorczyca discloses



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the step of blasting using SiC and claim 5 requires that "said step of blasting is carried out using SiO<sub>2</sub> or SiC".

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

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**Conclusion**

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lan Vinh whose telephone number is 571 272 1471.

The examiner can normally be reached on M-F 8:30-5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on 571 272 1465. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 308-0661.



LV

January 23, 2004